Assignment - 3

Q-1) **Answer the Following**

1) Define: Disjunction
2) Define: Implication
3) Ina Boolean Algebra prove that $x + x = x$
4) Using De' Morgan's Law, write the negation of $4 + 2 = 6$ and $4 \cdot 2 = 8$
5) Simplify the Boolean Expression: $x + x' \cdot (x + y) + y \cdot z$
6) Check the validity of the following argument:
   Hypothesis $S_1 : p \rightarrow q, S_2 : p \rightarrow r$
   Conclusion $S : p \rightarrow (q \wedge r)$
7) Show that S and T are equivalent where $S : \sim[p \vee \{(\sim p) \wedge (\sim q)\}]$ and $T : \sim p \wedge q$
8) Using truth table, prove that $(p \vee q) \vee r = p \vee (q \vee r)$
9) Express $f(a, b) = (a \cdot b) + (a' \cdot b) + (a \cdot b')$ as a product of sum canonical form
10) Show that $(D_8, +, \cdot, ', 1, 8)$ is a Boolean Algebra $\forall x, y \in D_8$
$$x + y = LCM \ of \ x, y$$
$$x \cdot y = GCD \ of \ x, y$$
$$x' = 8/x$$